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REMARKS

ON

GASTRO-INTESTINAL MYCOSIS,

CAUSED BY THE SMALLER FUNGI OR MOULDS.

BY

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REMARKS ON GASTRO-INTESTINAL MYCOSIS, CAUSED BY THE SMALLER FUNGI OR MOULDS.

By J. BRENDON CURGENVEN, M.R.C.S., etc.

In the present day, when the cause of disease is sought for in germs, spores, bacteria, bacilli, etc., any facts that will elucidate the subject are useful. The question of the cause of disease is always one of great interest and of the greatest importance, not only to the medical profession, but to the world at large; as, by the knowledge of the source of the evil, we, by sanitary and other precautions, are enabled to arrest the development of serious and fatal maladies.

The decomposition of animal and vegetable substances not only gives rise to deleterious and poisonous products, but the decomposing matters form a nidus for the development and growth of many of the lower forms of life, such as bacteria, vibrios, and a great variety of fungi and infusoriæ. The germs and spores of these microscopic forms of life are always present in the atmosphere, but not so plentifully as to become a source of danger to living and healthy plants and animals; yet weakly plants, insects, fish, and sometimes animals and man, are attacked by them. It is, however, more than probable that, during mild winters, such as the last, when vegetable decomposition goes on unchecked by frost, and an abundance of fungi grow and spread out over the whole of the fallen vegetation of the preceding summer, the spores of these fungi, or of certain poisonous moulds, are inhaled, and are arrested by the mucous surfaces of the mouth, nose, and pharynx, in such quantities as to produce the symptoms of an irritant poison of the fungus-class. Moreover, these spores, by giving rise to a fresh growth of fungi on the mucous membranes, add to the symptoms.

I have long been convinced that many of the cases of intestinal and gastro-intestinal catarrh prevailing in the autumn and spring are due to these products of vegetable decomposition; and when, some years ago, heaps of dead leaves were stored in Kensington Gardens, I always warned people not to go near them.

A great number of the large fungi are poisonous; and, by analogy, many of the smaller fungi may be equally poisonous if the quantity taken be sufficient, the symptoms being more or less severe according to the amount, and the state of health of the recipient. The usual symptoms of poisoning by fungi, such as the *Agaricus phalloides*, *muscarius*, and *integer*, and the *Boletus luridus*, are vertigo, nausea, vomiting, diarrhœa, exhaustion, convulsions, and death.

The action of muscarin, the poisonous alkaloid of *Agaricus muscarius*, according to MM. Koffe and Schmiedeberg, on animals is somewhat similar to that of Calabar bean, and is antagonistic to atropine. It produces a flow of saliva, vomiting, and diminution in the frequency of the pulse, the blood-pressure sinking immediately to one-third of the normal amount. The intestines and bladder become tetanically contracted. There is great debility of muscular energy, amounting at length to paralysis.

In 1862, a boy was admitted into the Royal Free Hospital, having eaten some toadstools, probably a species of *Bolbitius*, picked in the Regent's Park. He was in a state of collapse, insensible, almost pulseless, and with frequent vomiting.

I have no doubt that many of the moulds are poisonous. Of the *Mucedines; Penicillium crustaceum*, and some of the *Aspergilli* are the most common, growing on nearly all dead and dying animal and vegetable substances. The *Mucorini* are also very general, and the *Mucor mucedo*, that occurs on bread, preserves, etc., is poisonous. I have known a whole yard of fowls, about four dozen, destroyed by being fed on scraps of bread, a great portion of which was mouldy. The symptoms shown were diarrhœa, drooping, and sudden death, with convulsive twitchings. Horses have often been made ill or destroyed by mouldy provender.

A case was related to me, some years since, of a little boy being seized by an illness resembling measles, immediately after having some mouldy linseed-meal thrown in his face; the sneezing and lacrymation commencing directly after the occurrence, and the rash following. It is also recorded that many of the men in a regiment of soldiers, marching in Canada, and sleeping on musty straw in barns at night, were seized by a like illness.

The following cases will illustrate the poisonous effects of one of the moulds, probably the *Penicillium*, or *Aspergillus*.

The first patient was a married lady, aged about 40, delicate in constitution, but who enjoyed moderately good health. She had, for a week or two previously to the onset of this illness, complained of headache and langour. On February 15th, I prescribed for her an aperient, and an antacid mixture. On the 16th she was better, and on the 17th she was again in her drawing-room, and expressed herself as again feeling quite well. It must here be noted that the two days, the 15th and 16th, were spent in her bedroom.

On Monday, the 18th, she felt quite well, and was engaged in reading and writing in her drawing-room until half-past one o'clock. At that hour, and when sitting quietly on the sofa, she felt a giddiness, then a faintness. Being alone, she tried to throw off the feeling by changing her position, rubbing her hands, etc.; but the faintness increased; she struggled to the bell, rang it, and dropped faint into a chair. Her servant came and laid her on the sofa; she then vomited. There was complete muscular prostration; the faintness and vomiting continued, and she became rapidly collapsed and pulseless, the limbs cold, and the voice reduced to a whisper. At 3.15 P.M. the bowels acted loosely, and again at 3.45 P.M. Some tincture of opium (ten minims) was given with spirit of chloroform, and soon afterwards an injection of beef-essence and opium was administered. Brandy and beef-essence were also given, and injected into the rectum. At 5 P.M., the collapse and vomiting continuing, but without any action of the bowels, she was moved from the sofa to a mattress on the floor, before the fire, and hot water-bottles were put to the feet and the abdomen. There was no pain in the abdomen, which was flat and soft. She complained of a severe pain in the right shoulder. A mixture of bismuth, spirit of chloroform, and hydrocyanic acid was given at short intervals, and a mustard-poultice placed on the epigastrium. At 9 P.M., vomiting recurring at intervals of an hour. Champagne was tried with no success. Enemata of beef-essence and brandy were continued. Ice in small pieces was swallowed frequently. She complained of pain over the bladder, which was empty. At 12 o'clock, midnight, the pain in the right shoulder was severe. She had vomiting at intervals of two hours. The collapse and absence of pulse continued.

On February 19th, at 4 A.M., she passed on making an effort, about two drachms of bloody urine; the bladder was empty. A large linseed-meal and mustard poultice was placed over the kidneys; and, at 5.45 A.M. was replaced by a large linseed-meal poultice. At 9 A.M., Sir Andrew Clark saw her in consultation with Dr. Stephen and myself. He considered the illness due to some fungoid poisoning, a mycosis; and inquiry was made as to whether she had taken lately any preserved fruit or tinned food of any description; but it was distinctly stated that she had not; having been unwell, she had been living on very simple and plain diet. Sir Andrew related that he had once a severe attack of the kind, with collapse, from eating greengages, and that he knew of many cases of the kind occurring during the plum-season, from eating greengages that had their skins cracked, and on which there grew a mould. An effervescing draught and a pill containing half a grain of calomel were prescribed, to be taken every four hours. Beef-essence, and milk and soda-water were given as nourishment. At 1 P.M., the pulse was just perceptible, 96; respirations 24; temperature 99.7°. At 2.30 P.M., vomiting returned. I stopped the effervescing draught, and returned to the bismuth-mixture. She slept a little for the first time. There was no action of the bowels; and no urine was passed. At 4 P.M., an enema of a pint of warm water was given, which was retained. At 5.30 P.M., Sir Andrew saw her again with us. She complained of pain over the bladder and in the left groin. A hot poultice was applied to the abdomen; and at 7.30, as she could not pass urine on making an effort, a catheter was passed and a pint of urine drawn, which was high-coloured and slightly cloudy, relieving the pain of which she complained. No urine had been passed since the commencement of the illness (thirty hours).

February 20th, at 7.30 A.M., the urine was again drawn, a pint, light and clear, containing about one-tenth albumen. Pulse 92; temperature 99°. The bismuth and spirit of chloroform were continued. At 10.15 A.M., an enema of two pints of thin gruel was administered; this was retained. There was no peristaltic action of the bowels, which, like the bladder, seemed paralysed. The last vomiting was at 8.15 A.M., forty-three hours after the commencement of the attack. The bowels not having acted since the beginning of the illness, sulphate of soda was prescribed in an effervescing draught to be taken every three hours, for four doses; but there was no action until 6.15 A.M. on the 21st, fifty-eight hours since the last, when about half a pint of urine was also passed. Pulse still very small, 90; temperature 99.8°. At 7.30 P.M., a dessertspoonful of castor-oil was given, and the bowels acted at 10 P.M.

February 22nd.—Sir Andrew Clark continued to visit her daily with us, and took great interest in the case. She was improving in strength, although there was still a tendency to faint. She slept an hour or two at a time. Pulse 80; temperature 99.5°. She was passing urine at intervals, but with pain; the bladder also became painful when containing about half a pint. She was taking citrate of bismuth and citrate of potash; beef-tea, chicken-broth, milk, arrowroot, etc.

February 23rd.—The bowels acted in response to castor-oil. There was slight improvement in strength; the pulse was fuller and stronger.

February 24th.—The pain in the bladder continued, but was relieved on passing urine.

February 25th.—A little solid food was taken, and she was carried up to her bed-room in a sheet. The urine having a thick deposit and smelling of sulphuretted hydrogen, it was tested, and gave a slight reaction with lead. Under the microscope, the deposit was found to consist of pus-cells in abundance, vibrios, bacteria, and the mycelium and spores of a fungus quite covering the field of the object-glass. A 1½ per cent. solution of carbolic acid was injected into the bladder daily. On the second day after its use, the quantity of fungus diminished; on the third day there was very little, and after that none. The pus and bacteria continued in diminishing quantities for three weeks, coming apparently from the urethra and the neck of the bladder, as there was smarting pain on passing urine, and at the finish a pain at the neck of the bladder, but there was no urgency or frequency in passing it. There was for a day or two, when the fungus was first discovered, a smarting and burning of the genitalia and urethra, especially around its orifice, due probably to the presence of the fungus; this was relieved by a lotion of lead and hydrocyanic acid.

If it should be said that the germs of the bacteria and the spores of the fungus were introduced into the bladder by the catheter, they must have existed in great abundance in the air of the room, as neither in my experience nor in that of scarcely anyone else has such an occurrence been before observed. Bacteria can and do exist in the urine quite independently of catheterism. In a case of renal calculus now under my care, there are abundance of bacteria in the urine. I consider that the mucous membrane of the urinary tract was invaded by the fungus in the same manner as the gastro-intestinal, by the spores coming into contact with the orifice of the urethra and parts adjacent, and giving rise to the growth of mycelium, which spread up the urethra to the bladder. This would account for the smarting and burning pain of which the patient complained.

There was a great loss of muscular power in the legs. At the end of five weeks, she could not support her weight on the left, and she could not bear any weight on the right, nor advance it in the slightest degree. At the end of another two weeks, she could support her weight on the left, and she could raise the right from the floor. The paralysis gradually passed off under rubbing and massage.

The importance of this case was enhanced by the occurrence of others where the symptoms were similar, but not so severe. First, I, who had spent two nights and the greater part of two days in the room with the patient, was, on Wednesday, February 20th, seized with vertigo, faintness, and nausea, followed by one diarrhœal action; the symptoms passing off after a dose of bismuth and opium, a little hot brandy and water, and a few hours' rest. The next morning (February 21st), the sister, who came up from the country on the first day of the patient's illness, and who had spent the greater part of two nights and two days in the room, was seized with vertigo, faintness, nausea, vomiting, and diarrhœa. She was confined to her bed for five days; the most distressing symptom was that of faintness, or absolute prostration, as if sinking through the bed. She only had about five diarrhœal motions, yet the prostration was so great that it could only be ascribed to the effects of a poison acting on the nervous system—such as produced the sudden collapse in the case of her sister. The breath in both cases was heavy and offensive, very like the smell of stagnant water. In this case also, there was some paralysis of the muscles of the legs. On first getting up, she could not stand; the next day, she could stand with support; by degrees, she improved—at first, dragging her feet along the floor without the power of raising them; and, at the end of a fortnight, she had quite recovered. The husband of the first lady, a nurse, and a servant, who were a good deal in the room, also suffered from vertigo, nausea, and diarrhœa, with prostration, passing off in a few days, the other servants in the house remaining perfectly well.

On the sister being taken ill, who had not been exposed to any other air in the house but that of the drawing-room and her bedroom, I came to the conclusion that the poison, whatever it was, was in the drawing-room. On the morning of February 22nd, I examined the room, and found a great number of vases of cut flowers and shrubs, hyacinths in glasses, and unhealthy and dying plants in pots, that had escaped my notice in the dim light maintained. I had them all removed; and, when placed on the floor in the conservatory close together, they covered a space about six feet square. The foul water, when poured out, filled two buckets, and had an offensive smell. I omitted to examine the water microscopically, but the mould on the plants and vases and in the water was evident to the eye. This mould, I have no doubt, was either the *Penicillium crustaceum*, or the *Aspergillus glaucus*, or both, the most common moulds found on dead and dying vegetable matter. The fructification of the mould found in the bladder differed from both of these; but may not a mould have a different development in the human body, in the same manner as other parasites?

We cannot fail to see the similarity of the symptoms in the cases above related to those produced by the poisonous fungi; and the reason, I suppose, that we do not more often meet with such instances of poisoning by the fungus-moulds is, that it is not often they are met with in such a concentrated form as in this drawing-room, the air of which must have been full of spores. The patient had been suffering from headache and langour for a fortnight; she had, in consequence, neglected to attend to her plants and flowers, and the air of the room had been very little changed in that time. Since the occurrence of these cases, I had some drinking-water sent to me from Pinner, where some children in a family had been suffering from sickness and diarrhœa, and in this water I found the spores and fibres of a fungus; whilst, in another case of diarrhœa and vomiting with faintness, I found fungus-spores and fibres in the coating on the dorsum of the tongue.

Through the kindness of Sir Andrew Clark, I am enabled to give an exact representation of the sediment of the urine, drawn to scale with the camera lucida, by his friend and assistant, Dr. Sheridan Delépine.

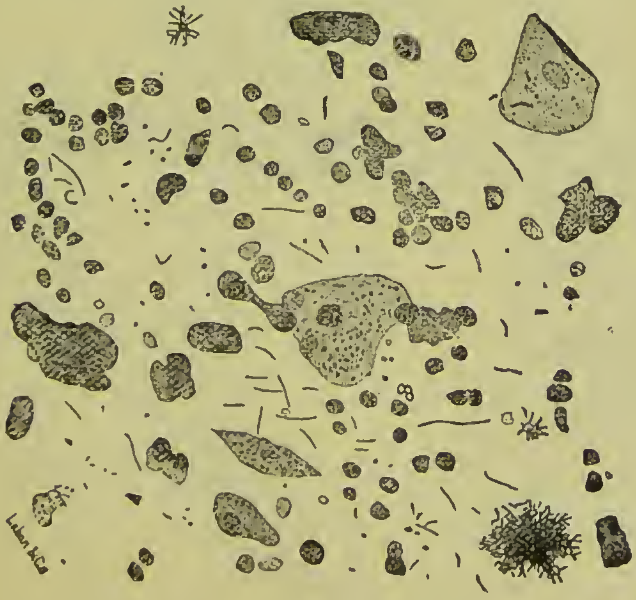

Fig. 1.

Fig. 1 shows the fungus-fibres and spores, the latter drawn a little too large, and the former too fine; there are also to be seen renal casts, renal and vesical epithelium, pus-corpuscles, and leucocytes, bacteria, and vibrios, magnified 300 diameters. Fig. 2 represents the various stages of growth of the fungus, magnified 1,200 diameters; the spores increasing by budding, and developing into fibres; those on the right of the line are the probable fully developed fungus. Fig. 3 represents the fungus-fibres, spores, micro-organisms, and pus-cells, as seen by myself with a power of 600 diameters.

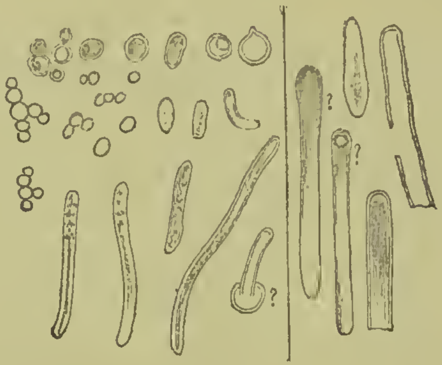

Fig. 2.

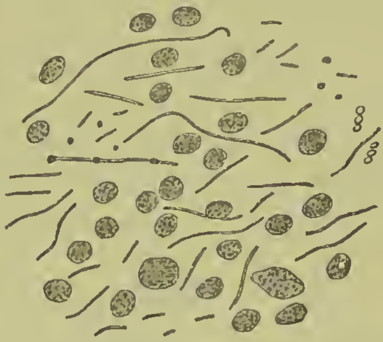

Fig. 3.